No. 8600152

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Ohio State University,
Ohio Agricultural Research and Development Center

WHEREAS, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF eighteen YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS PRESCRIBED BY THE OWNER OF THE RIGHTS. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT

'Becker'

In Testimony Whereof, *I have hereunto set my hand and caused the seal of the* Plant Variety Protection Office *to be affixed at the City of* Washington, D. C. *this* 30th *day of* September *in the year of our Lord one thousand nine hundred and* eighty-eight.

Attest:

Kenneth B. Evans
Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Richard E. Lyng
Secretary of Agriculture

APPROVAL EXPIRES 4-30-86

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

FORM APPROVED: OMB NO. 0581-0055

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions on reverse)

1. NAME OF APPLICANT(S)
Ohio State University, Ohio Agricultural Research and Development Center

2. TEMPORARY DESIGNATION
OH 234

3. VARIETY NAME
Becker

4. ADDRESS *(Street and No. or R.F.D. No., City, State, and Zip Code)*
1680 Madison Avenue
Wooster, OH 44691

5. PHONE *(Include area code)*
216-263-3700

FOR OFFICIAL USE ONLY

PVPO NUMBER
8600152

6. GENUS AND SPECIES NAME
Triticum aestivum L.

7. FAMILY NAME *(Botanical)*
Graminae

FILING
DATE: August 11, 1986
TIME: [X] A.M. [ ] P.M.

8. KIND NAME
Soft Red Winter Wheat

9. DATE OF DETERMINATION
9/28/84

FEES RECEIVED
AMOUNT FOR FILING: $ 1800.00
DATE: August 11, 1986
AMOUNT FOR CERTIFICATE: $ 200.00
DATE: August 25, 1988

10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION *(Corporation, partnership, association, etc.)*
Agricultural Experiment Station

11. IF INCORPORATED, GIVE STATE OF INCORPORATION

12. DATE OF INCORPORATION

13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS
Dr. H. N. Lafever
Agronomy Department
Ohio Agricultural Research and Development Center
Wooster, OH 44691
PHONE *(Include area code)*: 216-263-3886

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED
- a. [X] Exhibit A, Origin and Breeding History of the Variety *(See Section 52 of the Plant Variety Protection Act.)*
- b. [X] Exhibit B, Novelty Statement.
- c. [X] Exhibit C, Objective Description of Variety *(Request form from Plant Variety Protection Office.)*
- d. [X] Exhibit D, Additional Description of Variety.
- e. [X] Exhibit E, Statement of the Basis of Applicant's Ownership.

15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? *(See Section 83(a) of the Plant Variety Protection Act.)* [X] Yes *(If "Yes," answer items 16 and 17 below)* [ ] No

16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?
[X] Yes [ ] No

17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?
[X] Foundation [ ] Registered [X] Certified

18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.?
[ ] Yes *(If "Yes," give date)*
[X] No

19. HAS THE VARIETY BEEN RELEASED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES?
[X] Yes *(If "Yes," give names of countries and dates)*: U.S., September, 1985 (Sold as Foundation generation seed to producers of Certified class seed)
[ ] No

20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT: Howard N. Lafever (Breeder) — DATE: 4/23/86

SIGNATURE OF APPLICANT: Frederick E. Hutchinson (Director) — DATE: 4/23/86

FORM WA-470 (7-84) (Edition of 3-84 is obsolete.)

1

Exhibit A

Origin and Breeding History of the Variety

1. Becker (previously designated OH 234) originated at the Ohio State University, Ohio Agricultural Research and Development Center from the cross of Hart with a Virginia experimental line, designated Va. 66-54-10, which was never released as a variety. The cross was made in 1972 and designated 22272. Becker was first selected in 1975 as an F_3 plant and reselected in 1979 in the F_7 generation as described below. The pedigree 22272-19 was used to designate this line in early tests until it was assigned the designation "OH 234" in 1979. This line is a sister line of 'GR 855'.

2. Breeder seed of Becker consists of a bulk of the progeny of 17 F_7 plants selected for uniformity in 1979 and later years. Progeny growouts of these 17 plants appeared phenotypically identical and homozygous in the F_8, F_9, F_{10}, and F_{11} generations before they were bulked at harvest in 1983 as seed from F_{11} plants. (Progeny of 60 F_7 plants constituted the original selection in 1979 with progeny of 43 lines being dropped in the F_8 through the F_{11} generations as being off-type.) The first distribution of Foundation generation seed was made in the fall of 1985 to producers of Certified seed.

3. Becker appears to be very uniform and homogeneous as observed in the field for the past 6 seasons. This would be expected of the progeny of phenotypically identical plants selected in F_7 and reexamined for uniformity in the F_8 through the F_{11} generations.

4. Becker appears to be stable and true breeding as evidenced by agronomic and pathological examination of the F_8 through F_{11} generations in special purification and increase nurseries.

5. Variants observed during the development of this variety were few in number and of various, non-repeating phenotypes. In the 1985 Foundation generation production fields some repeating phenotype deviants were observed. These included both taller plants and awned or semi-awned plants. The total of such types did not exceed .5%. Other variants occasionally observed generally appeared to be the results of admixtures or outcrosses.

   Roguing of all observed off-types was performed three times in the bulked Breeder seed increase of 1984 (F_{12}) and two times in the Foundation generation increase of 1985 (F_{13}).

   Since Becker is extremely short and erect, admixtures or outcrosses are easily observed and can be rogued.

Criteria for selection during the multiplication and purification process (F_8-F_{11}) allowed no variance from complete uniformity. If one off-type plant was observed in a 10' row, that plant was either rogued or the row dropped from further increase. If two or more off type plants were observed within a row, the row was eliminated from further increase. The 17 remaining line descendents of selected F_7 plants were extremely uniform in appearance and disease reaction.

The variety was selected primarily for high yielding ability and extreme straw strength. Additionally, selection for all other important agronomic and quality traits was exercised. The variety was selected in comparison to popular varieties in Ohio, namely Adena, Hart, Titan and Tyler.

Exhibit B

Novelty Statement and Botanical Description of the Variety

Becker is an extremely short, midseason maturity variety of soft red winter wheat with dark green foliage. Straw strength is exceptionally high, being greater than any other currently grown variety in the same test during its period of development and evaluation. At maturity the heads remain fully erect. At heading the flag leaf is either erect or recurred depending on the level of fertility of the site. Winterhardiness under Ohio conditions is excellent. Late fall and early spring growth is mostly prostrate, however, the variety exhibits relatively rapid reinitiation of growth in the spring and the transition from prostrate to upright juvenile growth habit is relatively rapid. Leaves appear mid-wide and mid-long compared to other standard midwestern soft red winter wheats such as Arthur, Ruler, and Logan.

Becker is only moderately tolerant to acid soil conditions and is resistant to natural infections of loose smut (Ustilago tritici). It has moderately good resistance to most races of leaf rust (Puccinia recondita f. sp. tritici) based on field observations but is susceptible to powdery mildew (Erysiphe graminis f. sp. tritici) under Ohio conditions. Becker is classed as resistant to wheat spindle streak mosaic virus (WSSMV). Other pathogens of wheat have not occurred in Ohio frequently enough to adequately document the response of Becker to them.

Becker possesses the H_3 gene for resistance to races GP, A, C and F of Hessian fly (Mayetoila destructor, Say).

Becker heads one day later than Adena and four days later than Arthur in recent Ohio tests. Heads are fusiform and mid-dense with yellow anthers. Glumes are narrow to mid-wide with mostly oblique to rounded shoulders. Heads are apically awnletted with tip awns 1-2 cm in length.

Becker most closely resembles Adena, however, its height averages 2.5 cm shorter and it heads one day later. Phenol reaction of Becker is brown while Adena reaction is fawn.

Becker also closely resembles GR 855, a sister line, however it heads two days later and possesses moderately good resistance to leaf rust and is susceptible to powdery mildew while GR 855 possesses excellent resistance to powdery mildew and is susceptible to leaf rust. These two varieties also differ in phenol reaction and glume characteristics.

Addendum to Exhibit B, paragraph 5

Submitted 6/3/88 for 'Becker'. Application No. 8600152

Becker possesses the H_3 gene for resistance to Hessian fly (*Mayetoila destructor*, Say) while Adena possesses the H_7 and H_8 genes for resistance. Thus, Becker is resistant to races GP, A, C, and F of Hessian fly while Adena is resistant to only race GP. In addition, Becker possesses erect flag leaves at the beginning of heading except under extreme high fertility conditions while Adena flag leaves are recurved at heading. Also, Becker possesses very dark green foliage at booting while Adena possesses blue-green or gray-green foliage at booting. (Becker foliage color shown on Exhibit C as blue-green as this color of the 3 colors shown on Exhibit C is the closest to the actual color of Becker.)

FORM APPROVED: OMB NO. 0581-0055

EXHIBIT C
(Wheat)

U. S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
LIVESTOCK, MEAT, GRAIN AND SEED DIVISION
BELTSVILLE, MARYLAND 20785

OBJECTIVE DESCRIPTION OF VARIETY

WHEAT (*TRITICUM SPP.*)

INSTRUCTIONS: *See Reverse.*

NAME OF APPLICANT(S): Ohio State University, Ohio Agricultural Research and Development Center

ADDRESS (*Street and No. or R.F.D. No., City, State, and ZIP Code*):
1680 Madison Avenue
Wooster, OH 44691

FOR OFFICIAL USE ONLY

PVPO NUMBER: 8600152

VARIETY NAME OR TEMPORARY DESIGNATION: Becker

Place the appropriate number that describes the varietal character of this variety in the boxes below.
Place a zero in first box (e.g. [0][8][9] or [0][9]) when number is either 99 or less or 9 or less.

1. KIND:

[1] 1 = COMMON 2 = DURUM 3 = EMMER 4 = SPELT 5 = POLISH 6 = POULARD 7 = CLUB

2. TYPE:

[2] 1 = SPRING 2 = WINTER 3 = OTHER (*Specify*) _____ [1] 1 = SOFT 2 = HARD 3 = OTHER (*Specify*) _____

[2] 1 = WHITE 2 = RED 3 = OTHER (*Specify*) _____

3. SEASON - NUMBER OF DAYS FROM EMERGENCE TO:

[2][2][7] FIRST FLOWERING [2][3][2] LAST FLOWERING

4. MATURITY (*50% Flowering*):

[ ][ ] NO. OF DAYS *EARLIER* THAN ..... [ ] 1 = ARTHUR 2 = SCOUT 3 = CHRIS

[0][4] NO. OF DAYS *LATER* THAN ..... [1] 4 = LEMHI 5 = NUGAINES 6 = LEEDS

5. PLANT HEIGHT (*From soil level to top of head*):

[0][8][1] CM. HIGH

[ ][ ] CM. TALLER THAN ..... [ ]

[1][0] CM. SHORTER THAN ..... [1] 1 = ARTHUR 2 = SCOUT 3 = CHRIS 4 = LEMHI 5 = NUGAINES 6 = LEEDS

6. PLANT COLOR AT BOOTING (*See reverse*):

[3] 1 = YELLOW GREEN 2 = GREEN 3 = BLUE GREEN

7. ANTHER COLOR:

[1] 1 = YELLOW 2 = PURPLE

8. STEM:

[1] Anthocyanin: 1 = ABSENT 2 = PRESENT

[2] Waxy bloom: 1 = ABSENT 2 = PRESENT

[2] Hairiness of last internode of rachis: 1 = ABSENT 2 = PRESENT

[1] Internodes: 1 = HOLLOW 2 = SOLID

[0][4] NO. OF NODES (*Originating from node above ground*)

[2][0] CM. INTERNODE LENGTH BETWEEN FLAG LEAF AND LEAF BELOW

9. AURICLES:

[1] Anthocyanin: 1 = ABSENT 2 = PRESENT

[2] Hairiness: 1 = ABSENT 2 = PRESENT

10. LEAF:

[1-2] Flag leaf at booting stage: 1 = ERECT 2 = RECURVED 3 = OTHER (*Specify*): _____

[2] Flag leaf: 1 = NOT TWISTED 2 = TWISTED

[1] Hairs of first leaf sheath: 1 = ABSENT 2 = PRESENT

[2] Waxy bloom of flag leaf sheath: 1 = ABSENT 2 = PRESENT

[1][1] MM. LEAF WIDTH (*First leaf below flag leaf*)

[2][4] CM. LEAF LENGTH (*First leaf below flag leaf*):

8600152

11. HEAD:

[2] Density: 1 = LAX 2 = DENSE

[1] Shape: 1 = TAPERING 2 = STRAP 3 = CLAVATE 4 = OTHER *(Specify)* _____

[2] Awnedness: 1 = AWNLESS 2 = APICALLY AWNLETED 3 = AWNLETED 4 = AWNED

[2] Color at maturity: 1 = WHITE 2 = YELLOW 3 = PINK 4 = RED 5 = BROWN 6 = BLACK 7 = OTHER *(Specify)*: _____

[9.0] CM. LENGTH [11] MM. WIDTH

12. GLUMES AT MATURITY:

[3] Length: 1 = SHORT *(CA. 7 mm.)* 2 = MEDIUM *(CA. 8 mm.)* 3 = LONG *(CA. 9 mm.)*

[1] Width: 1 = NARROW *(CA. 3 mm.)* 2 = MEDIUM *(CA. 3.5 mm.)* 3 = WIDE *(CA. 4 mm.)*

[2-3] Shoulder shape: 1 = WANTING 2 = OBLIQUE 3 = ROUNDED 4 = SQUARE 5 = ELEVATED 6 = APICULATE

[1] Beak: 1 = OBTUSE 2 = ACUTE 3 = ACUMINATE

13. COLEOPTILE COLOR:

[3] 1 = WHITE 2 = RED 3 = PURPLE

14. SEEDLING ANTHOCYANIN:

[1] 1 = ABSENT 2 = PRESENT

15. JUVENILE PLANT GROWTH HABIT:

[1] 1 = PROSTRATE 2 = SEMI-ERECT 3 = ERECT

16. SEED:

[3] Shape: 1 = OVATE 2 = OVAL 3 = ELLIPTICAL

[1] Cheek: 1 = ROUNDED 2 = ANGULAR

[2] Brush: 1 = SHORT 2 = MEDIUM 3 = LONG

[1] Brush: 1 = NOT COLLARED 2 = COLLARED

[3] Phenol reaction *(See instructions)*: 1 = IVORY 2 = FAWN 3 = LT. BROWN 4 = BROWN 5 = BLACK

[3] Color: 1 = WHITE 2 = AMBER 3 = RED 4 = PURPLE 5 = OTHER *(Specify)* _____

[07] MM. LENGTH [04] MM. WIDTH [33] GM. PER 1000 SEEDS

17. SEED CREASE:

[1] Width: 1 = 60% OR LESS OF KERNEL 'WINOKA' 2 = 80% OR LESS OF KERNEL 'CHRIS' 3 = NEARLY AS WIDE AS KERNEL 'LEMHI'

[2] Depth: 1 = 20% OR LESS OF KERNEL 'SCOUT' 2 = 35% OR LESS OF KERNEL 'CHRIS' 3 = 50% OR LESS OF KERNEL 'LEMHI'

18. DISEASE: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

[0] STEM RUST *(Races)* _____ [2] LEAF RUST *(Races)* various (field) [0] STRIPE RUST *(Races)* _____ [2] LOOSE SMUT

[1] POWDERY MILDEW [0] BUNT [ ] OTHER *(Specify)* _____

19. INSECT: (0 = Not Tested, 1 = Susceptible, 2 = Resistant)

[0] SAWFLY [0] APHID *(Bydv.)* [0] GREEN BUG [1] CEREAL LEAF BEETLE

[ ] OTHER *(Specify)* _____

HESSIAN FLY RACES: [2] GP [2] A [1] B [2] C [1] D [1] E [2] F [1] G

20. INDICATE WHICH VARIETY MOST CLOSELY RESEMBLES THAT SUBMITTED:

CHARACTER	NAME OF VARIETY	CHARACTER	NAME OF VARIETY
Plant tillering	Caldwell	Seed size	Hart
Leaf size	Adena	Seed shape	Hart
Leaf color	Titan	Coleoptile elongation	Adena
Leaf carriage	Ruler	Seedling pigmentation	Titan

INSTRUCTIONS

GENERAL: The following publications may be used as a reference aid for the standardization of terms and procedures for completing this form:

(a) L.W. Briggle and L. P. Reitz, 1963, Classification of Triticum Species and Wheat Varieties Grown in the United States, Technical Bulletin 1278, United States Department of Agriculture.

(b) W.E. Walls, 1965, A Standardized Phenol Method for Testing Wheat Seeds for Varietal Purity, contribution No. 28 to the handbook of seed testing prepared by the Association of Official Seed Analysts. *(See attachment.)*

LEAF COLOR: Nickerson's or any recognized color fan should be used to determine the leaf color of the described variety.

7

Exhibit D

Additional Description of the Variety

No hairs are normally found on the flag leaf sheath of Becker plants, nor on the sheath of the first leaf below the flag leaf (Item 10, Exhibit C).

Glume shoulders range from oblique to rounded in heads of Becker and glumes are narrow to mid-wide, often within the same head (Item 12, Exhibit C).

Heads of Becker tend to be slightly brittle at full maturity under dry conditions such that breakage at a rachis node will often occur if one exerts leverage on the head. This does not appear to ever cause shattering or head losses in combining operations or under high wind conditions.

8600152

The Ohio State University

Ohio Agricultural Research and Development Center

Wooster, Ohio

RELEASE OF BECKER (P.I. 494524) SOFT RED WINTER WHEAT

The Ohio State University, Ohio Agricultural Research and Development Center announces the release of 'Becker', a new high yielding soft red winter wheat cultivar.

Becker (previously designated OH 234) resulted from the cross of Hart with a Virginia line designated Va. 66-54-10. First selected in 1975 as an F_3 plant, it was reselected in 1979 in the F_7 generation. Breeder seed consists of the bulk of the progeny of 17 F_7 plants selected for uniformity in 1979 and later years.

Becker was first tested in advanced trials in 1980. At the end of the 1984 season it had been tested in 30 state-wide trials in Ohio over the five years of testing. Becker also has been an entry in the Uniform Eastern Soft Red Winter Wheat Nursery continuously since 1981.

Becker is an awnless cultivar with mid-season maturity. It is the shortest statured cultivar yet released in the soft wheat region, averaging 13 cm shorter than Hart and 15 cm shorter than Titan. In addition to its short stature it has shown exceptional straw strength in Ohio and region-wide tests. Winterhardiness of Becker is excellent.

Test weight of Becker is classed as medium, averaging .8 lb/bu below that of Titan.

The USDA Soft Wheat Quality Laboratory, Wooster, Ohio, in evaluations of milling and baking quality of Becker has found it to possess excellent milling and baking quality, ranking 3rd in overall quality among 34 entries in the

Uniform Eastern Regional Nursery in 1983 and 3rd among 32 entries in this same nursery in 1982.

Becker is susceptible to powdery mildew (Erysiphe graminis) and moderately resistant to leaf rust (Puccinia recondita). It is also very resistant to wheat spindle streak mosaic virus. (See Table 4) Becker possesses resistance to Races A and C only of Hessian fly.

Becker has dark green foliage, fusiform heads held erect at maturity with white chaff and yellow straw.

Application will be made for Plant Variety Protection under the certification option for Becker. Its production will be limited to two generations only (Foundation and Certified) beyond Breeder seed.

Breeder seed of Becker will be maintained by The Ohio State Universtiy, Ohio Agricultural Research and Development Center. Seedings for the production of Foundation generation seed were first made in Illinois and Ohio in the fall of 1984.

Release of information to the general public regarding the name, release, or description of Becker may be made at any time.

Ted L Jones

Ted L. Jones
Acting Director
The Ohio State University
Ohio Agricultural Research and
Development Center

3/28/85
Date

Table 1. Comparative yields (Bu/A) of Becker and currently grown varieties in drill plot trials by years, Ohio.

Variety	1980 3 tests	1981 7 tests	1982 7 tests	1983 7 tests	1984 6 tests	Average 30 location-years
Adena	68.3	46.9	58.8	58.1	57.7	56.6
Hart	69.3	52.1	62.5	57.7	55.3	58.2
Titan	71.0	47.9	61.1	60.1	51.3	56.8
Becker	73.5	49.5	59.9	63.5	56.5	59.0
Tyler	-	-	-	64.2	57.5	-

Table 2. Comparative yields (Bu/A) of Becker and currently grown varieties in drill plot trials by locations, Ohio.

Variety	OARDC 1980-84	N.W. Br. 1980-84	W. Br. 1980-84	Mah. Co. 1981-84	S. Br. 1981-84	O.F.S. 1981-83	Veg. Cr. Br. 1981-84	Average 30 location-years
Adena	59.2	73.3	49.4	44.7	52.9	45.1	65.7	56.6
Hart	61.3	70.3	48.3	50.7	59.1	46.4	66.9	58.2
Titan	60.6	67.4	47.2	51.1	57.4	45.0	65.0	56.8
Becker	65.6	70.7	51.5	50.9	56.7	39.6	71.0	59.0

Table 3. Comparative performance of Becker and currently grown varieties in drill plot trials, Ohio, 1980-84. (Average of 30 tests)

Variety	Winter Survival (%)	Pl. Height (in.)	Date Headed (May)	Lodging (%)	Test Wt. (lb/bu)
Adena	97	33	28	7	56.5
Hart	96	37	27	4	57.7
Titan	93	38	31	13	56.5
Becker	96	32	29	1	55.7

Table 4. Comparative disease and aluminum tolerance ratings of Becker and currently grown varieties in miscellaneous Ohio tests.

Variety	% Mildew 9 tests-6 yrs.	WSSM[1] 6 tests-4 yrs.	Leaf Rust		% Scab 1 test	Take-all[1] 1 test	Al. tolerance	
			G.H. test[1]	Field- 5-tests-3 yrs			Avg. yield (% of Seneca)	Avg. score[2]
							3 yrs	6 yrs.
Adena	49	.75	7	13 MR	1	3	51	5.8
Hart	77	1.00	6	28 MS	8	2	61	6.5
Titan	37	2.00	7	4 MS	3	3	73	3.5
Becker	73	2.00	4	1 MR	8	4	66	4.2

[1] 0 = none to 9 = severe.
[2] 0 = very tolerant to 9 = very sensitive.

Table 5. Results of state-wide drilled plot yield trials including Ohio advanced wheat lines, 1985. (In order by average yield in 6 tests.)

Entry	Yield (bu/a) OARDC (Wooster)	N.Western Br. (Custar)	Western Br.(S. Cha'ston)	Mahoning Co. Farm (Canfield)	Veg.Crops Br. (Fremont)	Southern Br. (Ripley)	Avg. Yield 6 Tests	Straw Yield (T/A)	Avg. Date Headed (May)	Avg. Pl.Ht. (in.)	Avg. Lodg. (%)	Leaf Rust[2]	Avg. Test Wt. (lb/bu)
OH 256	87.3	102.5	71.9	75.7	116.9	56.8	85.2	2.83	12	33	0	20R	59.0
OH 244	87.4	105.3	70.8	73.9	113.5	53.1	84.0	2.97	15	38	1	1VR	59.6
OH 286	89.1	110.8	68.3	79.0	114.4	41.6	83.9	2.94	16	35	0	10VR	58.3
OH 262	87.8	110.8	65.3	74.2	114.3	47.8	83.4	2.97	15	34	0	2VR	58.9
Becker	91.0	101.0	67.5	76.9	108.0	55.5	83.3	2.58	15	32	0	10R	57.9
OH 265	89.6	108.9	64.7	70.6	112.4	53.1	83.2	3.02	14	36	3	5VR	60.5
OH 257	82.7	99.3	65.2	74.6	116.5	49.3	81.3	3.36	17	37	0	7VR	60.5
OH 308	83.5	104.6	0.3	69.1	113.4	47.2	79.7	3.36	12	35	1	15R	59.6
OH 285	87.1	105.3	62.4	62.9	115.7	40.1	78.9	2.91	14	38	1	17VR	59.3
Titan	81.1	92.4	63.6	70.5	106.2	53.7	77.9	3.27	17	39	11	35MS	58.9
OH 3021	80.8	94.5	66.7	73.4	100.7	50.2	77.7	2.47	14	34	0	20MR	58.0
Adena	81.7	91.9	65.1	65.0	103.6	51.0	76.4	2.44	12	32	6	40MR	59.9
OH 260	83.1	86.4	62.7	69.3	105.6	47.1	75.7	2.28	10	32	0	0VR	60.6
Tyler	85.1	97.8	54.1	67.0	101.5	46.3	75.3	3.58	14	39	3	70MS	59.1
OH 3041	77.3	87.5	62.3	69.4	97.4	47.5	73.6	2.94	10	37	2	20MR	60.3
5% L.S.D.	3.9	2.6	5.2	6.4	6.7	4.4		.14					

[1] Denotes lines dropped from breeding program following 1984 season.
[2] % - class. (Avg. of 2 reps - Western Br.)

Quality Evaluation of Becker

(Data taken from U.S.D.A. Soft Wheat Quality Laboratory Reports)

In evaluations of composite samples of 14 lines and varieties grown at 6 locations in 1984, Becker (OH234) received a combined quality score of 85.0. Comparative scores for Hart, Tyler, and Titan, three widely grown varieties in Ohio were 78.3, 70.5, and 60.9, respectively.

In evaluations of composite samples of 16 lines and varieties grown at 7 locations in Ohio in 1983, Becker received a combined quality score of 92.0. Comparative scores of Hart, Tyler, and Titan were 89.7, 79.9, and 85.7, respectively.

In evaluations of composite samples of 15 varieties and lines grown at 7 locations in Ohio in 1982, Becker received a combined quality score of 99.5. Comparative scores of Hart, Tyler, and Titan were 82.2, 88.0, and 81.7, respectively.

(See attached tables 1-3)

Table 1. Wheat, milling, and flour analytical and baking data, and quality scores. Drill plot entries from Wooster, Ohio, 1984 crop.

WHEAT AND MILLING DATA

LAB NO.	ENTRY	MILLING QUALITY SCORE	BAKING QUALITY SCORE	COMBINED QUALITY SCORE	TEST WT.	BREAK FLOUR YIELD	ST.GR. FLOUR YIELD	RED. PASSES	FRIABILITY	E.S.I.	MILLABILITY
***	STANDARD	100 A	100 A	100 A	62.7	29.8	76.4	7	28.4	11.1	106.9
***	BENCHMARK	105.9A	109.A	105.A	61.6*	35.6	76.3	7	28 *	10.4	114.1
057	ADENA	100 A	100 A	100 A	62.7	29.8	76.4	7	28.4	11.1	106.9
058	HART	92.8 C	78.3F	78.3F	62.6	32	74.4Q	7	27 Q	12.9*	93.4 *
059	TYLER	100 A	70.5F	70.5F	62.2	32.4	76.2	7	28.5	11.4	105.7
060	TITAN	93.6 C	60.9F	60.9F	62.7	33.6	74.8*	7	26.8Q	12.5*	93.6 *
061	OH 234	94.5 C	85 D	85 D	62.3	34	75.9	7	27.7Q	11.5	95.3 *
062	OH 235	95 B	98.2B	95 B	61.6*	30.5	76.1	7	28.2	10.8	99.1
063	OH244	106.5A	103.A	103.A	63.1	30.6	77.6	7	29.2	9.6	116.9
064	OH 256	93.4 C	78.4F	78.4F	62.2	32	75.4*	7	27.3Q	12	94.8 *
065	OH 257	97.2 B	69.9F	69.9F	63.1	26.8Q	75.9	7	27.7Q	11.6	103.8
066	OH 260	109.7A	93.6C	93.6C	64.8	31.9	77.9	7	29.3	9.5	120.2
067	OH 262	98.1 B	95.1B	95.1B	61.7*	38	75.6	7	28.6	11.8	99.3
068	OH 265	100.8A	89.5D	89.5D	63.1	35.8	76.3	7	29	11.4	103.8
069	OH 285	107.2A	113.A	107.A	63.4	29	77.5	7	29.8	9.3	118.9
070	OH 286	101.2A	97.2B	97.2B	61.8*	37.2	76.6	7	29.3	11	104.9

STRAIGHT-GRADE FLOUR

LAB NO.	FLOUR PROTEIN %	ASH %	MICRO AWRC %	COOKIE DIAMETER CM.	TOP GRAIN
***	9.74	.39	48.4	17.89	4
***	8.9	.35	51.3*	18.35	7
057	9.74	.39	48.4	17.89	4
058	10.9Q	.38	50.3*	17.56*	1*
059	9.01	.39	52.6Q	17.39Q	2*
060	10	.39	51.6Q	17.16Q	1*
061	9.18	.43*	49.7	17.57*	3
062	10.2	.43*	48.3	17.87	4
063	9.4	.39	47.9	17.91	4
064	10.2	.41	50.7*	17.54*	2*
065	10.4*	.38	50.4*	17.33Q	3
066	11.2Q	.38	48.2	17.82	3
067	9.38	.41	51 *	17.91	5
068	9.9	.41	51 *	17.81	3
069	10.1	.39	46.9	18.15	5
070	9.93	.42*	49.9	17.93	3

15

86001152

Table 2. Wheat, milling, and flour analytical and baking data, and quality scores. Drill plot entries from Wooster, Ohio, 1983 crop.

LAB NO.	ENTRY	MILLING QUALITY SCORE	BAKING QUALITY SCORE	COMBINED QUALITY SCORE	MILLAB. SCORE	TEST WT. KG/HL	WHEAT PROT. %	WHEAT ASH %	PSI %	EBI %	RED PASS	BREAK FLOUR YIELD	FLOUR YIELD	FRIAB. %
107 10	OH260	103.8A	100.3A	100.3A	117.8	78.9	10.4*	1.6	38.6	9.1	8	31.9*	76.8	28.1
***	STANDARD	100 A	100 A	100 A	103.7	77	9.6	1.53	40.2	11.7	8	33.9	75.4	27.1
096 3	ADENA	100 A	100 A	100 A	103.7	77	9.6	1.53	40.2	11.7	8	33.9	75.4	27.1
110 13	OH285	105 A	98.3 B	98.3 B	119.1	78.3	9.8	1.62	37.4*	9	8	30.7*	76.6	28.1
103 2	OH244	107.6A	97.3 B	97.3 B	117.8	77.5	9.3	1.53	38.7	9.1	8	34.1	77	28.5
***	BENCHMARK	104.8A	96.2 B	96.2 B	112.5	79.3	9.6	1.45	39.2	10.4	8	35	76.6	27.6
109 12	OH265	94.5 C	94.2 C	94.2 C	90.5 *	77.3	9.2	1.69	44.1	12.1	8	38.3	74.5*	26.3 Q
111 15	OH286	92.5 C	93 C	92.5 C	87.9 *	76.3	9.3	1.69	45.2	12.3	8	39	74.4*	26.3 Q
101 4	OH234	92 C	92.4 C	92 C	87.1 *	76.3	9.1	1.67	46	12.4	9	38.4	74.5*	25.3 Q
105 8	OH256	90.5 C	93 C	90.5 C	91 *	76.9	10	1.67	39.4	12.1	8	34.2	73.6Q	25.7 Q
102 6	OH235	93.2 C	89.8 D	89.8 D	98.7	76.5	9.7	1.64	38.2*	11.6	8	33.7	74.9	26.6 *
097 11	HART	89.7 D	90.5 C	89.7 D	91.4 *	76.2*	10.3*	1.65	40	12.7	8	34.6	73.5Q	25.9 Q
100 1	OH220	94.3 C	88.2 D	88.2 D	96.4	77.3	10.3*	1.64	46.9	11.8	9	35.4	75.4	26.4 Q
108 16	OH262	87.1 D	96.9 B	87.1 D	80.2 Q	75.7*	9.5	1.65	44.7	13.6*	9	39.3	73.8*	25.4 Q
098 5	TITAN	91.8 C	85.7 D	85.7 D	90.6 *	76.7	9.6	1.65	39.7	12.9*	8	36.6	73.9*	25.9 Q
099 14	TYLER	102.7A	79.9 F	79.9 F	108.2	77	9	1.5	39.1	11.6	8	34.8	75.6	27.8
104 7	OH255	78.8 F	87.1 D	78.8 F	79.1 Q	78.2	10.8Q	1.71*	36.4Q	13.8*	9	31.7*	72.7Q	24 Q
106 9	OH257	86.8 D	74 F	74 F	96.9	78.3	10.8Q	1.74*	33.5Q	12	8	29.8Q	75.2	26.4 Q

STRAIGHT-GRADE FLOUR

LAB NO.	PROT. %	ASH %	ADJ." MACM. VISC.	MICRO AWRC %	COOKIE DIAM. CM.	TOP GRAIN
107	9.1	.36	67	47.7	18.67	7
***	7.8	.36	91	48.8	18.31	7
096	7.8	.36	91	48.8	18.31	7
110	8.5	.35	55	49.1	18.7	7
103	7.8	.37	10	48.5	18.21	6
***	8.5	.36	85	50.6*	18.57	3*
109	7.7	.4 Q	97	51.5*	18.25	6
111	7.8	.41Q	11	51.4*	18.17	6
101	7.4	.4 Q	82	51.5*	18.12	6
105	8.6	.37	97	50.1	18.32	6
102	8.1	.39*	59	49.4	18.06*	7
097	8.6	.36	78	50.7*	18.22	6
100	9	.39*	91	52.3Q	18.26	5
108	7.8	.41Q	10	50.6*	18.25	6
098	8.4	.37	84	51.3*	18.08	6
099	7.6	.35	13	50.8*	17.69Q	5
104	9.3	.37	73	49.6	18.22	6
106	9	.38*	70	50.4*	17.85*	6

Table 3. Wheat, milling, and flour analytical and baking data, and quality scores, Drill Plot entries from Wooster, Ohio, 1982 crop.

LAB NO	ENTRY	MILLING QUALITY SCORE	BAKING QUALITY SCORE	COMBINED QUALITY SCORE	MOIS. PCT.	TEST WT. KG/HL	PROT. PCT.	ASH PCT.	WHEAT PART. SIZE INDEX PCT	WHEAT ENDOSP SEPN. INDEX PCT.	RED. PASS	BREAK FLOUR YIELD PCT.	FLOUR YIELD PCT.	MILLAB SCORE
WOOSTER, OHIO														
MILLING STD. = 82002 - ROLAND														
BAKING STD. = 82002 - ROLAND														
82001	4 HART	96.5 B	82.2 E	82.2 E	10.4	80.0	10.3	1.58	36.7	12.2	9.	29.3	74.3*	99.2
82002	6 ROLAND	100.0 A	100.0 A	100.0 A	10.3	80.2	10.2	1.62	38.1	11.3	9.	30.1	75.8	102 4
82003	9 TITAN	97.7 B	81.7 E	81.7 E	10.1	78.8*	9.6	1.58	35.9*	11.4	9.	31.9	74.7*	99 4
82004	25 TYLER	106.9 A	88.0 D	88.0 D	10.4	78.9*	9.7	1.49	37.1	10.9	9.	31.0	75.6	113.7
82005	10 OH188	105.2 A	100.1 A	100.1 A	10.3	77.9Q	9.7	1.45	38.3	11.0	9.	30.6	75.7	109.8
82006	12 OH220	99.8 B	78.3 F	78.3 F	10.4	79.2*	11.0*	1.61	47.1	12.8*	11.	33.5	75.7	104.1
82007	14 OH234	99.5 B	105.0 A	99.5 B	10.3	77.1Q	9.5	1.55	41.5	11.6	10.	34.0	74.6*	97.3
82008	15 OH235	95.4 B	97.4 B	95.4 B	10.0	76.9Q	9.9	1.54	37.6	11.4	9.	30.1	74.5*	96.2
82009	17 OH244	112.4 A	92.3 C	92.3 C	10.1	80.1	10.3	1.45	36.4	9.1	9.	27.9*	77.3	126.5
82010	19 OH255	84.2 E	72.4 F	72.4 F	10.3	79.6	11.1*	1.60	35.2*	14.0Q	10.	27.5*	73.4Q	85 4
82011	20 OH256	97.5 B	86.0 D	86.0 D	10.4	78.9*	10.6	1.58	38.1	11.9	10.	30.3	74.7*	101 5
82012	21 OH257	102.4 A	76.3 F	76.3 F	10.6	80.7	10.4	1.67	35.3*	10.7	9.	27.7*	75.9	111.2
82013	22 OH260	110.9 A	105.8 A	105.8 A	10.2	80.2	10.4	1.55	39.7	8.9	9.	31.8	76.9	119 8
82014	23 OH265	96.1 B	90.0 C	90.0 C	10.2	79.4*	10.0	1.60	37.9	12.9*	9.	36.1	74.3*	95.5
82015	PIONEER X6890	101.3 A	84.0 E	84.0 E	9.6	80.9	10.7	1.45	39.9	11.5	10.	32.1	75.3	104.5
	STANDARD	100.0 A	100.0 A	100.0 A	10.3	80.2	10.2	1.62	38.1	11.3	9.	30.1	75.8	102.4

STRAIGHT-GRADE FLOUR

LAB NO	MOIS. PCT.	ASH PCT.	PROT. PCT.	VISC. AS IS MACH.	VISC. ADJ. MACH.	MICRO AMRC PCT.	COOKIE DIAM. CM.	TOP GRAIN
82001	14.2	.38	9.0	57.	73.	54.0Q	17.8*	5.
82002	13.7	.41	8.9	67.	93.	50.2	18.1	7.
82003	13.9	.39	8.4	49.	79.	52.5*	17.6Q	7.
82004	13.8	.36	8.1	69.	121.*	51.0	17.7*	7.
82005	13.7	.38	8.2	52.	87.	50.2	18.0	7.
82006	14.0	.39	10.1Q	94.	89.	54.6Q	17.6Q	5.
82007	13.8	.40	8.1	44.	76.	50.0	18.1	8.
82008	13.9	.40	8.7	37.	53.	50.7	18.0	6.
82009	14.1	.37	9.2	67.	82.	50.4	17.9	6.
82010	14.1	.39	9.9*	70.	70.	52.3*	17.4Q	6.
82011	13.9	.38	9.5*	61.	97.	51.2	17.7*	6.
82012	14.2	.38	9.0	49.	61.	51.9*	17.4Q	4.*
82013	14.2	.39	9.2	61.	76.	49.5	18.2	7.
82014	14.1	.38	8.8	62.	87.	51.4	17.8*	6.
82015	13.8	.39	9.6*	74.	79.	52.9*	17.7*	5.
	13.7	.41	8.9	67.	93.	50.2	18.1	7.

17

8600152

Exhibit E

Statement of the Basis of Applicant's Ownership

The original cross, early line evaluation, selection, reselection/ purification and final multiplication were all performed by the applicant breeder (Dr. H. N. Lafever) or his technical assistants on the property of the Ohio State University, Ohio Agricultural Research and Development Center utilizing funds provided for such research. The variety is intended for release as a public variety in the United States.